Electronic Version
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Claims

[c1] What is claimed is:

1.A model based crystallization controller, comprising:
a plurality of models, wherein said plurality includes at least one modeled component and at least one crystallization recipe model, and wherein each of said at least one modeled components is communicatively connected to at least one of said at least one recipe models;
an executor resident above said plurality that coordinates at least one of the modeled components with at least one of the recipes to provide for virtual control of a crystallization correspondent to said at least one recipe model; and
at least one interface that communicatively connects the executor to the crystallization, wherein said at least one interface converts the virtual control to actual control of the crystallization.

[c2] 2.The model based crystallization controller of claim 1, wherein the crystallization comprises a crystal growth over time within a predetermined tolerance for growth rate.

[c3] 3.The model based crystallization controller of claim 2,

wherein an increased temperature stimulates the growth rate.

[c4] 4.The model based crystallization controller of claim 2, wherein an increased feed rate stimulates the growth rate.

[c5] 5.The model based crystallization controller of claim 2, wherein a catalyst stimulates growth rate.

[c6] 6.The model based crystallization controller of claim 1, wherein the virtual control comprises real time control.

[c7] 7.The model based crystallization controller of claim 1, wherein the virtual control controls at least two selected from the group consisting of heat loss, at least one valve overshoot, rising temperature, and feed volume.

[c8] 8.The model based crystallization controller of claim 1, wherein at least one tolerance is maintained in real time by the virtual control, and wherein one of the at least one tolerance comprises a feed volume over a number of seconds to be added to the crystallization to maintain a crystal growth temperature.

[c9] 9.The model based crystallization controller of claim 1, wherein said at least one interface comprises at least one COM interface.

[c10] 10.The model based crystallization controller of claim 1, wherein said at least one recipe comprises at least two equations each having at least two predetermined coefficients and at least two variables.

[c11] 11.The model based crystallization controller of claim 10, wherein said at least one recipe provides for modification of at least one of the at least two variables by the executor for virtual control.

[c12] 12.The model based crystallization controller of claim 11, wherein said at least one interface provides feedback to said executor of the actual control, and wherein the feedback allows said at least one recipe to modify at least one of the at two variables.

[c13] 13.The model based crystallization controller of claim 12, further comprising at least one integrated developer associated with said executor, wherein said at least one recipe is developed within said at least one integrated developer.

[c14] 14.The model based crystallization controller of claim 1, wherein the actual control of the crystallization has a minimum crystallizing temperature overshoot in a range of about 1.2 degree F, and a minimum crystallizing temperature undershoot in a range of about 3/10ths of a

degree F.

[c15] 15.A model based controller, comprising:
a plurality of models, wherein said plurality includes at least one modeled component and at least one chemical recipe model, and wherein each of said at least one modeled components is communicatively connected to at least one of said at least one recipe models;
an executor resident above said plurality that coordinates at least one of the modeled components with at least one of the recipes to provide for virtual control of at least one chemical process correspondent to said at least one recipe model; and
at least one interface that communicatively connects the executor to the chemical process, wherein said at least one interface converts the virtual control to actual control of the chemical process.

[c16] 16.The model based controller of claim 15, wherein the virtual control comprises real time control.

[c17] 17.The model based controller of claim 15, wherein the virtual control controls at least two selected from the group consisting of temperature, volume, pressure, reactant entry, and catalyst entry.

[c18] 18.The model based controller of claim 15, wherein said

at least one interface comprises at least one COM interface.

[c19] 19.The model based controller of claim 15, wherein said at least one recipe comprises at least two equations each having at least two predetermined coefficients and at least two variables.

[c20] 20.The model based controller of claim 19, further comprising at least one integrated developer associated with said executor, wherein said at least one recipe is developed within said at least one integrated developer.

[c21] 21.A method of controlling at least one chemical process, comprising:
modeling a recipe of a performance of the at least one chemical process to a modeled recipe;
modeling at least one device that engages the performance of the at least one chemical process to a modeled device;
communicatively connecting the modeled device to the modeled recipe in a model executor;
coordinating, within the model executor, the modeled device with the modeled recipe to provide virtual control of the modeled device by the modeled recipe; and
converting the virtual control to actual control of the at least one device via a COM interface.

[c22] 22.The method of claim 21, further comprising:
distributing at least two of the at least one mechanical devices remotely from each other; and
associating the executor with a location of one of the at least two remotely distributed mechanical devices.